OKLAHOMA AGRICULTURAL EXPERIMENT STATION

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Hessian Fly.

Last fall great damage was done to the wheat in some sections of Oklahoma by the Hessian fly and farmers are apprehending considerable loss from this insect during the spring months. Letters are continually being received at the Station asking for a descripton of the pest and the best methods of combating it, also asking about the advisability of sowing oats in wheat fields that have been destroyed by the fly. The opinion seems to prevail that the Hessian fly will attack and destroy oats and a great many farmers are hesitating about sowing on that account. This is a mistake for as far as we know at present the larva of the Hessian fly does not feed upon the oats crop at all; its food plants being wheat, rye, and barley. Farmers need have no fear therefore of the loss of their oats crop from this source.

All fields that are badly infested with the fly and have suffered serious damage already should be plowed under at once in such a way as to destroy the larva and prevent the escape of the adults. If the wheat is allowed to stand the stubble should be burned immediately after harvest, the ground plowed thoroughly, and all volunteer wheat destroyed.

Judging from the tone of the letters received at the Station making inquiries about this insect, the average farmer does not understand very much about the life history of this pest and a brief description of the insect and its habits will be given here.

LIFE HISTORY

This insect is supposed to have been introduced into the United States by the Hessian soldiers during the war of the Revolution, hence the name. From New York, where first introduced, it has spread to most of the wheat growing regions of the United States and is the cause of enormous losses to the wheat raisers of this country.

The adult female fly, a small dark colored, two-winged, gnat-like insect about one-half the size a common mosquito, which it greatly resembles, lays its eggs on the upper sides of the base leaves of the plant,

usually depositing a large number in a single place. They usually lay from a 150 to 250 eggs. These eggs hatch in four or five days and the young larva crawl down the leaf to the sheath near the base and there they feed. Their position is usually below the surface of the soil in the fall brood but considerably higher in the spring brood. The insect remains here for a period of from three to six weeks, depending upon the weather; and derives its nurishment by sucking the sap of the plant. When mature it goes into the pupa stage usually known as the "flaxseed" on account of the resemblence of the pupa case to this seed. In Oklahoma the second brood passes most of the winter in this stage. In the early spring the adult insects emerge from these pupa cases and deposit eggs for the spring brood.

The Hessian fly is a comparatively new insect in Oklahoma and its life history here has not been worked out carefully. There seems to be little doubt, however, but that there are three broods here. Just what time they appear cannot be definitely stated. Judging from the extent of the infestation last fall, one would be led to conclude that there had been a considerable number of insects in last year's crop. In some districts nearly all the early sown wheat is infested showing that quite a large brood had come over from the crop before and deposited eggs on volunteer and early sown wheat. The flies that come to maturity on this wheat were plentiful enough to infest considerable areas and in some cases to destroy the crop completely. In such cases the land should be plowed at once before the fly has a chance to emerge, and some crop that is immune like oats, cotton, or corn planted instead.

Weather conditions have a great deal to do with the development of this insect. Moist, warm weather acts favorably, and under such conditions the insects develop very rapidly, while on the other hand dry, cold weather retards growth and if prolonged is often fatal. In this respect the Hessian fly is just the opposite of the chinch bug.

NATURAL ENEMIES

Under normal conditions the various parasitic insects that prey upon the Hessian fly kill every year from fifty to ninety per cent. of the insects before they reach maturity. Notwithstanding this great reduction in numbers, this pest is capable of doing great damage. The parasites that prey upon the fly resemble it so closely that the farmer is seldom able to distinguish between friend and foe. There is one difference that every one should remember. The Hessian fly has only one pair of wings, the second pair being merely slender, club-like rudiments. Except in those species entirely wingless, the parasites all have two pair of wings, the first pair being considerably larger than the second.

PREVENTIVES

During years of great infestation the earlier sown fields are always the ones to suffer most. To escape damage from this insect, wheat should be sown as late as climatic conditions will warrant. In Oklahoma, wheat sown the latter part of October last fall shows but little infestation compared with adjoining fields that were sown earlier. As a rule the early sown wheat gives better yields in Oklahoma than late sown wheat and it will be necessary to vary the dates of seeding to suit the conditions. Late seeding is practiced in order to withhold food from the insects until they have starved. In order to do this effectually it is necessary to plow early and destroy all volunteer wheat. Plow early to destrory all the insects possible, and prevent the growth of volunteer wheat so as to compel the female to lay her eggs where the young larva will find nothing to feed upon. If every farmer would follow this practice the damage done by this pest would be slight indeed.

PASTURING

In Oklahoma the pasturing of early sown wheat will have a beneficial effect if the Hessian fly is present. The practice should not be followed, however, if the "green bug" is in the field. Pasturing causes the wheat to stool, or tiller, and these new stems are not infested. Then again large numbers of the "flaxseed" are eaten if the wheat is pastured closely.

DECOY STRIPS

A trap crop is sometimes sown in strips through the field in August. The pests will attack these strips in great numbers and when they are fully infested they should be plowed under as deeply as possible.

ROTATION OF CROPS

No man can expect to cope snccessfully with insect enemies who will not adopt some sort of a system of rotation. The growing of one kind of crop on the same ground for a number of years in succession is conducive to greatly increased insect depredations. Wheat, barley, and rye are the only crops attacked by the fly. If your fields become infested with the insect change to corn, cowpeas, cotton, or some other immune crop and in this way starve it out. The practice not only destroys insect pests but gives better results in other ways. Do not neglect to rotate.

DESTROYING THE STUBBLE

The wheat stubble of infested fields should be burned as soon after harvest as weather conditions will permit. Burning is a very bad practice usually and should not be resorted to except in cases of infestation. Plow as soon after burning as possible.

RESISTANT VARIETIES

Select those varieties that have a heavy stiff stem and a tendency to tiller freely. Early Red Clawson is an example of this type. It is said that the macaroni wheats are not as liable to attack by the fly as other kinds. Mr. Webster, of the Bureau of Entomology, in a recent communication states that a Baldwell, Kans., a small field of soft wheat sown September 6th showed about ninety-five per cent. infestation. This was much greater than that of hard wheat sown at the same time. At that point all seedings made between September 6th and October 7th were badly infested. The seedings made after October 16th were entirely free.

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